GEOGRAPHIC SCHOOL BULLETINS

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Photograph from Publishers' Photo Service

PIE MEANS SMILE IN ANY LANGUAGE, EVEN ESKIMO

The largest English-speaking land in the world, Canada has a non-English-speaking fringe in the north, where Eskimos and Indians live. Together, however, these two peoples number only 129,000, about one per cent of the Dominion's population. The Eskimo is still a trapper, as in the days of the first white men in Canada, and he still sells pelts to the Hudson's Bay Company. He catches fish, with a primitive barbed fish spear unless he can buy one of the white man's nets, and hunts caribou, but pie also appeals to the blubber-eating Eskimo—when he can get it. When caribou grew scarce ten years ago, the Canadian Government imported a herd of reindeer from Alaska to feed Eskimo tribes. These boys were photographed on ice-capped Baffin Island, which spreads its barren 240,000 square miles beyond Hudson Bay—one of the world's half-dozen largest islands and Canada's northeasternmost land (Bulletin No. 2).

HOW TEACHERS MAY OBTAIN THE BULLETINS

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Crimean Peninsula: Key to the Black Sea

IN THE history of the past 25 centuries, the Crimean Peninsula has been involved in many wars. Only in recent times has it developed economically, and therefore become an even more valuable prize of warfare. Its economic importance, its naval bases, and its strategic position across the Black Sea from Russia's oil-wealthy Caucasus have inspired the prolonged battle between Russians and German invaders for its possession. Bases there might dominate Black Sea traffic.

Jutting far south into the Black Sea, the Crimea has a comparatively mild climate that especially appealed to the people of Russia's windswept steppes.

Florence Nightingale Served in Crimean War

The peninsula was the scene of the Crimean War fought in the mid-nineteenth century by Russia against Great Britain, France, and Turkey. As one result of that conflict the Crimea had 500 deserted villages. Sufferings of soldiers in Crimean battles called Florence Nightingale into action and made her famous for her nursing services as the "Lady with the Lamp."

The bulging peninsula, little larger than Vermont, has about 750,000 inhabitants. Roughly, it is diamond-shaped, attached to the Soviet mainland on the north by a strip of land three miles wide.

Because of its peculiar geographic position, the Crimea has been washed by many waves of migration that have complicated the ancestry of its peoples. These waves caused fluctuations also in prosperity and population (illustration, next page).

Islands and Railroad Join Peninsula to Mainland

The irregular northeast coast fringes off into stepping-stone islands that enable a railroad to cross them between the Ukraine and the Crimea.

The railroad was largely responsible for raising Sevastopol from the ruins of the Crimean War to become a city of 80,000 population and ultimately a major Soviet naval base. Feodosiya and Kerch, to the east, are normally the other principal Crimean ports; the former gained its early renown as a slave market. Inland Simferopol, capital of the Crimea, is a university city and cultural center.

The Crimea has southeast coastal mountains which form a windbreak and are responsible for the mild climate of the shore. Royal residences, chateaux, and luxurious hotels were built in this long-popular Riviera of imperial Russia, where flowers blossom all year. Old palaces of Tsarist days have more recently served as rest houses for Soviet workers.

The mountains consist of three ranges gradually rising to heights of 4,500 feet. Atop the southernmost range, which drops sharply toward the sea, is a tableland of Alpine pasture. Gorges and waterfalls add to the scenic beauty, while in the many valleys are the Crimea's richest farms, with vineyards, orchards, and forests.

One-half the population is engaged in agriculture, mostly in the steppe land which covers four-fifths of the peninsula. This has become one of Russia's important wheat areas. Irrigation and scientific farming have turned onetime arid lands into productive acres, yielding grain, sorghum, cotton, and tobacco.

The eastern extension of the Crimea has iron mines whose once low-grade product has been improved. Phosphorus for fertilizer is a by-product. The Crimea also produces natural asphalt, manganese ores, borax, salt, sodium sulphate, iodine, cement, and gypsum. It has oil refineries, brickyards, and tanneries.

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Photograph by John Mills, Jr.

YOUNG CANADA'S ABUNDANT WOOD MAKES NEWS AND NEWSPAPERS

While much of the United States' forests has been cut over, Canada still has an untouched abundance of "the forest primeval, the murmuring pines and the hemlocks" which Longfellow's "Evangeline" described in 18th century Nova Scotia. One and a quarter million square miles of the Dominion is forest-covered, an area a third as large as the entire United States. The most valuable Canadian exports into the U. S. are wood products. Newsprint, the one-ton rolls of paper that feed newspaper presses, crosses the border in hundred-million-dollar volume each normal year. Wood pulp, pulp wood, Christmas trees, shingles, railroad ties, and palings are other forms in which Canadian logs reach U. S. consumers. The acres of peeled logs awaiting shipment to the United States were photographed in Nova Scotia (Bulletin No. 2).

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Canada Makes Close Harmony on Continental Scale

THE 3,986-mile boundary line between the United States and Canada grows fainter and fainter as a division. In August, 1940, a military alliance between the two countries was concluded at Ogdensburg, New York, and eight months later at Hyde Park an economic alliance. Now comes announcement of the Joint Defense Production Committee which will coordinate the manufacture of war materials on both sides of the border.

As these close neighbors in geography draw even closer in their business relations, they bring close harmony to nine-tenths of a continent, the largest section of that third of the world known as the "English Language Empire" because it is ruled by English-speaking peoples. Canada, which alone comprises one-fourth of the whole British Empire and is one-fifth again as large as the United States, has the greatest area of any English-speaking nation, surpassing Australia and ranking next to China and the U.S.S.R. among the world's geographic giants.

U. S. Needs Canadian Metals for Defense Program

This largest English-speaking area, however, resembles the United States in having many settlers of foreign extraction whom it has beckoned overseas to help develop the land. A third of the people in the Provinces of Manitoba, Saskatchewan, and Alberta are foreign-born. A fourth of the Dominion's total population speaks French, making the Province of Quebec a monument to the French pioneers who opened up Canada before the British conquered it in 1760. German, Scandinavian, Russian, Polish, and Dutch settlers now outnumber Canada's Indians and Eskimos together (illustrations, next page and cover).

Trade between the United States and its bigger sister state to the north is greater than that between any other two countries on earth. Travel between them has carried fifteen million tourists a year northward across the border to Canadian play spots from the Gaspé to Vancouver, becoming the Dominion's fourth largest source of income. United States citizens have invested an estimated four billion dollars in Canada and now own one-quarter of the Dominion's peacetime industry.

Uncle Sam looks to Canada for supplies of those metals vitally needed in his defense program—nickel, for which Canada is the world's best source, and copper, in production of which the Dominion ranks third. Fireproof asbestos for lining brake-bands in automobiles, radium, and the newsprint on which newspapers are printed are the other leading imports. In return, the United States normally sends Canada three times as much of that country's imports as Britain does.

Radium Ores Discovered from the Air

It was fur from the beavers of Canada's innumerable lakes and streams that lured the white man deeper and deeper into the Canadian wilderness. But the gold glittering in the gravel of the Klondike's Bonanza Creek, discovered in 1896, pointed the way to other riches of the bleak forest lands—the minerals that have been in some cases worth more than their weight in gold. Fourteen different metals enter world trade from Canada's mines and smelters, including those rarer metals, uranium, selenium, tellurium, cadmium, and bismuth.

Gold, silver, and platinum are no longer the most precious. Looking down from an airplane above the Great Bear Lake, a body of half-frozen water larger than the State of Massachusetts, astride the Arctic Circle, a prospector in 1929

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Note: The National Geographic Society's Map of Europe and the Near East shows the Crimea, outlining its railroads, and showing important cities such as Simferopol, Sevastopol, Yalta, and Feodosiya, with their alternate names accompanying the present titles. A price list for the map may be obtained from the Society's headquarters in Washington, D. C.

Bulletin No. 1, December 1, 1941.

Photograph by Dr. Vera Danchakoff

TATARS HAVE MADE THE FLOWERY CRIMEA THEIR HOME SINCE GENGHIS KHAN

Russia's sunny-south peninsula of the Crimea lured Tatar conquerors to settle there as early as the 13th century. Genghis Khan was one of the Tatar sovereigns making it their western headquarters. They brought their captives to be sold at the Crimean slave market of Theodosia (Feodosiya). Descendants of the Tatars, like this shepherd lad, have a mixed ancestry because of intermarriage with Greeks and Russians. Since winter temperatures rarely drop below freezing, the Crimea flowers with abundant fruit trees (background), especially pomegranates, olives, and figs. The bagpipe was probably familiar to people of eastern Europe long before the far-traveling Norse introduced it into Scotland. The Tatar bagpipe, like the typical Scottish instrument of today, has a perforated pipe which the player fingers and additional pipes through which he expels air by pressing on the bag with his left arm. He tunes the instrument by changing the length of the pipes.

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Palau to Timor, Route of New Japanese Air Line

IN THE Netherlands Indies, the "filling station of the Orient," a "No-Sale" sign is hanging out when would-be purchasers from Portuguese Timor try to buy high-octane gasoline for airplane fuel.

This reluctance to sell gasoline to Timor follows closely the announcement of a new Japanese air line to operate between the Japanese-mandated Palau Islands and the town of Dili in Timor. The new route covers some 1,300 miles of the island-studded waters separating the South Pacific from the Indian Ocean. For more than half of the course, the air line will have to soar above or around the islands and waters of the Netherlands Indies. The service was authorized by an agreement between Japan and Portugal, in which the Netherlands Indies government did not concur.

Will Skirt Philippines near Northern Terminus

The northern end of the route will skirt American-patrolled waters off the southwestern shores of the Philippines. Timor, the southern terminus, is only 350 miles from the Australian coast in the British Empire defense sphere. The important naval station of Darwin is almost due south of Timor.

The Palau or Pelew Island group, which lies in the Pacific only two hours' bomber flight east of Mindanao in the Philippines, already is linked by regular air services with Tokyo, 2,000 miles to the north.

Germany bought the Palau Islands from Spain in 1899. After the World War they were placed under mandate to Japan. Now Japanese outnumber the natives there (illustration, next page).

The islands' total area is only a little more than half that of New York City. Low coral isles in the south give way to higher, more rugged islands in the north, which are of volcanic origin.

Stone from Palau Treasured as Yap Money

The surrounding seas yield abundant fish and mollusks. From waving coconut palms comes the region's chief product—copra.

The Palau Islands are famous as the source of the peculiar stone money once used on Yap Island in the Caroline group—disks of rock varying in diameter from six inches to twelve feet.

Southwest from the Palau Islands, the new air line will cross or pass near several of the eastern islands of the Netherlands Indies, among them western New Guinea, Halmahera, and Ceram.

Timor a Divided Island with Two European Masters

The island of Timor serves two masters. The western portion belongs to the Netherlands. Portugal's share is the eastern part, together with the small region of Okusi Ambeno which is surrounded by Netherlands territory. Portuguese territory occupies more than half of the area of the 300-mile-long, Maryland-size island.

Koepang, capital of the Netherlands section, is a stop on the regular air route from Malaya and Java to Australia.

Dili (Dilli), where the new Japanese air line will have its terminus, is the chief town and administrative center of Portuguese Timor.

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noticed rock formations that led to discovery of pitchblende, the pitchy black material from which radium is extracted. Now a refinery at Port Hope, Ontario, processes the Arctic pitchblende and ships radium by air to hospitals all over the continent. The abundance of Canadian radium has already halved market prices.

In the past Canada has been a mining, logging, and farming country, with spectacular wheat crops ripening on the Canadian Great Plains. The population is sparsely distributed, in keeping with these pioneer occupations; more than nine-tenths of the area is almost uninhabited. Ninety per cent of the people live within 200 miles of the United States border.

Defense needs, however, are pushing Canada forward in industry. One new airplane factory in Ontario turns out fifteen planes a week. A new machine gun plant is described by officials as producing more guns than any other factory now operating in the world. Montreal makes tanks, Windsor makes trucks. The Great Lakes shores are the site of a steel industry, Quebec of an aluminum industry.

Note: Canada of today is discussed in the November, 1941, issue of the *National Geographic Magazine* in "Canada's War Effort." See also: "Salty Nova Scotia," May, 1940; "Exploring Yukon's Glacial Stronghold," June, 1936; "Canada from the Air," October, 1926.

See the following GEOGRAPHIC SCHOOL BULLETINS: "British Empire Is 30 Per Cent American," January 15, 1940; "Canada: Britain's Biggest Annex," November 6, 1939; "European Colonies Make Non-American Spots in the Americas," October 23, 1939; and "British Columbia, Storehouse of Canada's Far West," March 6, 1939.

The Society's Map of Canada, showing important highways, railroads, and contours, was published as a supplement to the June, 1936, *Magazine*. An inset on the map shows the Dominion's natural resources, the time zones, and the routes of principal explorers.

Bulletin No. 2, December 1, 1941.

IN NEW-STYLE WAR PAINT CANADA'S BRAVES STILL GO ON THE WARPATH

Prime Minister Mackenzie King, head of the only American nation which has yet declared war in the present emergency, smokes a peace pipe with two of Canada's Indian veterans of World War I (photographed at Piapot in Saskatchewan). The veteran chiefs, retired from active service, may wear symbolically the beaded and feathered war dress of their ancestors. But the two young recruits now enlisted in an all-Indian platoon wear the regulation topee and shorts issued as regular summer wear to the other 230,000 soldiers in Canada's army. Modern Indians are taught to be proud that the Huron word for "settlement", *Kanada*, overheard by the French explorer Cartier on the banks of the St. Lawrence, became the name of the Dominion.

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The Simple Arithmetic of Complex High-Octane Gasoline

A "bubble tower" more fantastic than the medieval alchemist's contraptions, a Greek word for "eight," a chemist who made 33,000 experiments before success, a sick workman at a Civil War distillery—all these curious factors enter into that vital need, for air warfare, high-octane gasoline.

The United States has recently started a program to treble the nation's output of this necessity for flight. Present production is about 40,000 barrels a day.

Chemical Yardstick Invented To Measure Anti-Knock

High-octane gasoline has high anti-knock qualities. Everyone has heard the hammer-blow banging that sometimes develops in an automobile motor when the car is starting or climbing a hill. It comes from the cylinder of the automobile—and likewise of airplane motors—where a mixture of gasoline and air is burning. The knock is the noise from an almost-explosion.

Motor knock was almost unheard of until the high-compression engine was developed. This squeezed more air and gasoline into less space in the engine cylinder, to provide more power. But under the increased pressure, the gasolines of 20 years ago tended to burn with such speed as to simulate an explosion, which made a dangerous strain on engine parts, especially in airplanes.

Dr. Thomas Midgley, Jr., after 33,000 experiments, found that tetraethyl lead added to gasoline made a non-knocking or "anti-knock" fuel.

To measure gasoline's anti-knock qualities, the "octane-count yardstick" was invented ten years ago. The yardstick is a chemical mixture of two unfamiliar liquids, called iso-octane and normal heptane, small-quantity by-products in the refining of petroleum. Only the slightest trace of either occurs naturally in gasoline.

Gasoline Is "Doped" for Aviation Use

The iso-octane, generally called octane for short, is a clear colorless fluid, nearly odorless, which burns with less knock than any regular gasoline on the market. Heptane, on the other hand, knocks more loudly than any gasoline. Varying combinations of the two, therefore, make a performance yardstick or standard "reference fuel" against which the anti-knock qualities of any commercial gasoline can be compared. The octane number of a gasoline corresponds to the percentage of octane in the yardstick fuel which the gasoline matches in anti-knock qualities.

If a gasoline causes the same amount of knock as a mixture of 60 per cent octane and 40 per cent heptane, it is a low-grade fuel of 60 octane rating. If it corresponds to a 70 per cent octane-30 per cent heptane mixture, it ranks as a 70 octane fuel, about average among the regular gasolines sold for automobile use today. If it matches an 80 per cent octane mixture, it is premium quality automobile gasoline. But aviation gasoline must have a 92 octane count or more.

To the layman, it may seem silly to test samples of gasoline by comparison with a mixture never used as fuel. Why not, he may ask, analyze the gasoline and judge from its make-up how it will perform? The answer is that no one has yet been able to identify all the chemicals that make up petroleum. For one factor which is known, a hundred remain unidentified.

Some aviation fuels are superior to 100 per cent octane, and are referred to as 115 octane gasolines or even 125 octane gas.

These gasolines of high anti-knock qualities have been attained by selection,

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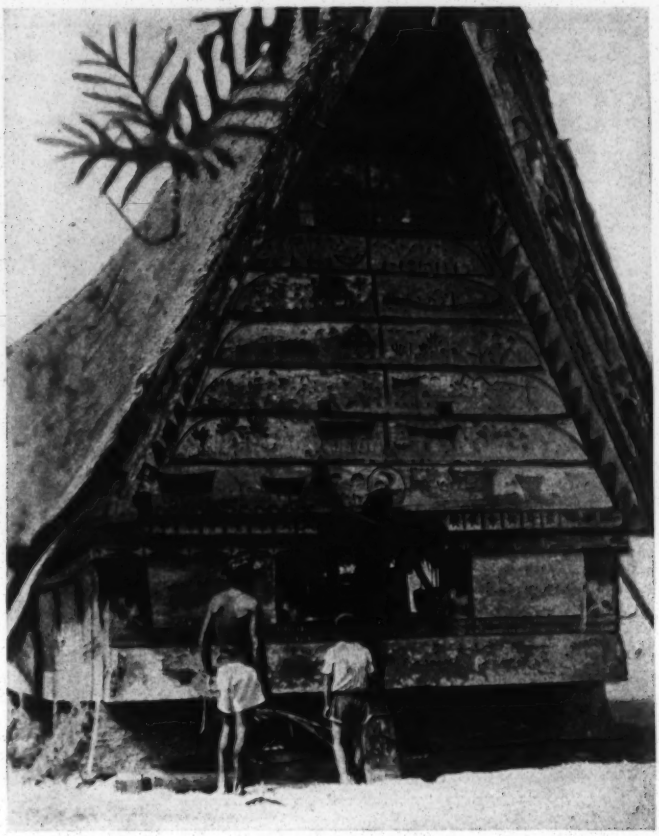
Total population of the colony is approaching half a million. Good roads help in transporting the coffee, copra, hides, wax, and sandalwood which are the major exports.

Earthquakes are common in mountainous Timor, whose agriculture is influenced by seasons of extreme drought and extreme wet. Timor has rich resources of oil, copper, and gold, largely undeveloped.

Note: The National Geographic Society's Map of the Pacific Ocean outlines Timor and the Palau Islands in the Pacific. This map has 73 insets of islands and harbors, including one which shows on a larger scale the islands of the Palau group. A price list for maps may be obtained from the Society's headquarters in Washington, D. C.

Bulletin No. 3, December 1, 1941.



Photograph by Willard Price

PALAU BOYS STUDY THEIR HOMEWORK IN THE ISLAND'S HISTORY FROM PICTURE WRITING ON THE WALL

Beams, joists, and door lintels of the palm-thatched houses of the Palau Island group are decorated with border designs of stars, rectangles, and other geometrical figures—no two exactly alike. But the end walls of the council house, under the high-pitched roof, are bright with murals depicting the tribal legends of the island, each event portrayed in its authentic setting of swaying palm trees and houses with pointed roofs. This council house was photographed on Peleliu, the southernmost island of the Palau group. Any narrative of Palau history usually includes the coming of the Spaniards, then of the Germans, who purchased the islands, and finally of the Japanese, to whom the group was mandated after the first World War.

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War Aid to "Arabian Nights" Ports of Persian Gulf

BASRA, Abadan, and Bandar Shahpur are some of the strange Oriental names that may figure in any Near East supply line. These steamy spots on the Persian Gulf are possible receiving points for military supplies shipped from the U. S. to British armies occupying Iraq and Iran, as well as for materials routed through those countries to the U.S.S.R.

Persian Gulf ports are more than twice the sailing distance from New York around Africa's Cape of Good Hope that Vladivostok is from San Francisco across the Pacific. Nevertheless they command the only route now feasible from the south to the Soviet Union. From New York to Basra, at the head of the Persian Gulf, is a journey of more than 11,500 miles.

Coasts That Sindbad the Sailor Knew

Iran owns all except one of the vital ports along the Arabian Nights coast of the Persian Gulf, a water course of ancient wars and even modern slave trade and piracy. For Iran occupies the entire northern and eastern curve of the Gulf, with the exception of a less-than-50-mile stretch of shore held by Iraq at the narrow head of the waters.

Basra, home town of Sindbad the Sailor, is accessible through this Iraqi stretch. Lying some 50 air miles inland, below the junction of the historic Tigris and Euphrates rivers, it is the nation's only port of consequence. It was occupied by British troops during the World War, and again recently when Iraq was taken over. The city normally has a population of about 85,000. Its port facilities are reported to be excellent as the result of extensive improvements in the last two decades. These include new machinery, wharves, dockyards, and warehouses. Basra also has a seaplane base and a modern airport, suggesting its possible use as a station for ferrying bombing planes (illustration, next page).

Abadan Has Pipe Line But No Rails

South of Basra, on the opposite or Iranian side of the combined Tigris-Euphrates stream of Shatt-al-Arab, is Iran's busy oil port of Abadan. Outlet of the modern oil pipe lines that run from the southwest oil fields of Iran, this settlement of some 40,000 people in peacetime handles millions of tons of oil exports as well as a reverse stream of heavy machinery and other important supplies.

Abadan, however, has no railway communications. Iran's only completed cross-country line extends north from Bandar Shahpur, a made-to-order port with the coming of rails, which lies east of Abadan on the Persian Gulf coast. Even this extensive railroad, which reaches the Caspian Sea after a journey of more than 850 miles over plain and mountain, desert and oasis country, provides no direct rail route to Soviet Russia. Any shipments for Russian use would have to be transferred to vessels bound for Soviet distribution points on the Caspian.

The seaports of the Persian Gulf have had a rôle in trade as well as in turbulent international affairs since earliest times. Some authorities believe the Gulf was a traffic center before the Mediterranean was sailed. Because of its central location, it was an essential trade link between East and West during the Middle Ages. Marco Polo knew the ancient port of Hormuz, which flourished not far from what is now Bandar Abbas, on the sea vestibule leading to the Arabian Sea.

Portuguese explorers of the 16th century came this way. British, French, and

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"doping", and special processes in the refinery. Some gasolines are naturally of high octane count, such as those from California and Texas. Others come from the process of "cracking"—putting gasoline under such pressure and heat that the big molecules crack and break apart into smaller ones. This vital process is attributed to a sick workman who left his petroleum still and let its temperature get high enough accidentally to make the first "cracked" gasoline in 1855.

The special high-octane aviation fuels, developed for their high anti-knock properties, are mixtures of regular gasoline and certain chemicals which prevent too-rapid burning in the cylinder. Octane (from Greek for its "eight" carbon molecules) and small quantities of tetraethyl lead are two of the most important.

Note: The article, "Today's World Turns on Oil," in the *National Geographic Magazine* for June, 1941, discusses the uses of oil today, and contains natural color photographs showing oil and its derivatives in use, and the processes of obtaining and refining oil.

Bulletin No. 4, December 1, 1941.

Photograph by Chicago Architectural Photo Co.

THE OIL REFINERY'S BUBBLE TOWER IS A FACTORY IN ITSELF

This model of a petroleum refinery, in Chicago's Museum of Science and Industry, has glass sides to reveal the inner workings. The most important operation takes place in the two tall "bubble towers" (at right and left edges of the exhibit), where petroleum is "fractionated" or separated into its commercially useful fractions—gasoline, kerosene, fuel oil, lubricating oil, paraffin waxes, and asphalt. Crude oil first enters a pipe still (right of center: cubical building with projecting roof and attached smokestack), where it is heated, then it is pumped into the bottom of the bubble tower. There the hot oil turns into vapor and floats to the top of the tower; then each successive tray, cooler than the one below it, condenses the vapor of one fraction of petroleum. Through pipes tapping various trays in the bubble tower, the products are drawn off into the receiving house (visible to left of tower), where coils of water pipes on top further condense and cool them, then into temporary storage tanks called "run-down" tanks.

Dutch trading companies jockeyed for commercial position along the shores. While the pilgrims were landing at Plymouth, Massachusetts, England was making her first show of power in Eastern waters. At that time a British trading expedition defeated the Portuguese off Jask just outside the Persian Gulf. Prior to the World War, the Gulf was an important goal in the German *"Drang nach Osten"* (Push to the East) and of the Russian Tsars' ambition for an outlet to the Indian Ocean, as an alternate to northern ports that froze in winter.

Note: For map study, see the National Geographic Society's Map of the Bible Lands, which shows the Persian Gulf with its surrounding ports, oil fields, pipe lines, and railways. This map was published as a wall map supplement to the *National Geographic Magazine* for December, 1938.

On a smaller scale, the Gulf appears on the Map of the Indian Ocean, published with the March, 1941, issue of the *Magazine*, and also in the inset of the Middle East on the Map of Europe and the Near East, which was published as a supplement to the May, 1940, *Magazine*.

See also the following *National Geographic Magazine* articles: "Bombs Over Bible Lands," August, 1941; "Old and New in Persia," September, 1939; and "Change Comes to Bible Lands," December, 1938.

GEOGRAPHIC SCHOOL BULLETINS on Persian Gulf countries include: "Iraq Presents Problem in Billion Dollar Diplomacy," May 5, 1941; "Oil of Near East Involves U. S. and 11 Other Countries," November 11, 1940; and "Modern Spillway for Ancient Euphrates," May 13, 1940.

Bulletin No. 5, December 1, 1941.

Courtesy Hills Brothers Co.

MODERN SINDBADS SET OUT FROM BASRA ON NEW ARABIAN NIGHTS ADVENTURES

Adventure stories that start at Basra today deal with moving war materials into Iraq through troubled Red Sea and Persian Gulf waters, or the shipment of Turkish tobacco, poppy-seeds, wool, licorice root, and opium bound for the United States. While local water traffic is poled along in the unchanging gondola-like boats of Arab seamen, land travel moves by such modern means as the truck on the bridge in the left background. Regular schedules of flying-carpet service are maintained at Basra's huge airport, a stop on the British Overseas Airways route to India, China, and Australia. Sindbad the Sailor set out from this same Persian Gulf port in the delta of the Shatt-al-Arab, the slow stream formed when the Tigris and the Euphrates flow together below the traditional Garden of Eden.